

In Re Patent Application of:
Dale R. Setlak, Et Al
Serial No: 08/858,144
Filed: May 16, 1997

21 a third metal layer [adjacent] on said second dielectric layer and comprising an array of electric field sensing electrodes connected to active circuit portions for generating signals related to a sensed fingerprint.

[In Claim 2, line 2, delete "adjacent" and insert -- on-- therefor.

22. (Amended) A fingerprint sensor comprising:
a substrate;
a plurality of semiconductor devices adjacent said substrate and defining active circuit portions for generating an output related to a sensed fingerprint;
a package surrounding said substrate; [and]
finger charge bleed means for bleeding a charge from a finger upon contact therewith to protect the active circuit portions, said finger charge bleed means comprising a second external electrode carried by said package for contact by a finger and a charge bleed resistor connected between said second external electrode and an earth ground.

[Please cancel Claim 23 without prejudice.

[In Claim 24, line 1, delete "23" and insert --24-- therefor.

23 2930. (Amended) A method for making a fingerprint sensor comprising the steps of:

forming a plurality of semiconductor devices [adjacent] on a substrate and defining active circuit portions;

forming a first metal layer on the substrate interconnecting predetermined ones of the plurality of semiconductor devices;

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forming a first dielectric layer [adjacent] on the first metal layer;

forming a second metal layer [adjacent] on the first dielectric layer defining a ground plane;

forming a second dielectric layer [adjacent] on the second metal layer; and

forming a third metal layer [adjacent] on the second dielectric layer and comprising an array of electric field sensing electrodes connected to active circuit portions for generating signals related to a sensed fingerprint.

In Claim 31, line 3, delete "adjacent" and insert -- on-- therefor.

34 25. (Amended) A method for controlling operation of a fingerprint sensor of a type comprising a plurality of semiconductor devices [adjacent] on a substrate and defining active circuit portions for generating an output related to a sensed fingerprint, a package surrounding the substrate, [and] a first external electrode carried by the package for contact by a finger, and power control means positioned on the substrate and connected to the active circuit portions, the method comprising the steps of:

only powering active circuit portions upon sensing finger contact with the first external electrode to thereby conserve power; and

grounding active circuit portions upon not sensing finger contact with the first external electrode.

In Claim 37, line 7, delete "an" and insert --a-- therefor.

36

In Re Patent Application of:
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Please add the following new claims:

38. A fingerprint sensor comprising:
a substrate;
a plurality of semiconductor devices adjacent said substrate and defining active circuit portions;
a first metal layer interconnecting predetermined ones of said plurality of semiconductor devices;
a first dielectric layer adjacent said first metal layer;
a second metal layer adjacent said first dielectric layer defining a ground plane;
a second dielectric layer adjacent said second metal layer;
a third metal layer adjacent said second dielectric layer and comprising an array of electric field sensing electrodes connected to active circuit portions for generating signals related to a sensed fingerprint;
a package surrounding said substrate and having an opening aligned with the array of electric field sensing electrodes;
a first external electrode carried by said package for contact by a finger; and
excitation drive means connected between the ground plane and said first external electrode for generating electric fields between the electric field sensing electrodes and adjacent finger portions.

39. A fingerprint sensor comprising:
a substrate;
a plurality of semiconductor devices adjacent said substrate and defining active circuit portions;
a first metal layer interconnecting predetermined ones of said plurality of semiconductor devices;

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a first dielectric layer adjacent said first metal layer;

a second metal layer adjacent said first dielectric layer defining a ground plane;

a second dielectric layer adjacent said second metal layer;

a third metal layer adjacent said second dielectric layer and comprising an array of electric field sensing electrodes connected to active circuit portions for generating signals related to a sensed fingerprint;

a shield electrode adjacent each electric field sensing electrode; and

an amplifier having an input connected to each electric field sensing electrode, and having an output connected to each respective shield electrode, said amplifier having an amplification gain greater than about one to thereby increase noise rejection.

40. A fingerprint sensor comprising:

a substrate;

a plurality of semiconductor devices adjacent said substrate and defining active circuit portions for generating an output related to a sensed fingerprint;

a package surrounding said substrate;

a first external electrode carried by said package for contact by a finger;

power control means for controlling operation of active circuit portions based upon sensing finger contact with said first external electrode;

at least one conductive layer comprising an array of electric field sensing electrodes connected to active circuit portions; and

excitation drive means connected to said first external electrode for generating electric fields between the

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electric field sensing electrodes and adjacent finger portions.

41. A fingerprint sensor comprising:
a substrate;
a plurality of semiconductor devices adjacent said substrate and defining active circuit portions for generating an output related to a sensed fingerprint;
a package surrounding said substrate;
a first external electrode carried by said package for contact by a finger;
power control means for controlling operation of active circuit portions based upon sensing finger contact with said first external electrode, said power control means comprising protection means for grounding active circuit portions upon not sensing finger contact with said first external electrode; and
finger charge bleed means for bleeding a charge from a finger upon contact therewith, and wherein said finger charge bleed means and said protection means cooperate so that active circuit portions remain grounded until said bleed means bleeds the charge from the finger.

42. A method for making a fingerprint sensor comprising the steps of:
forming a plurality of semiconductor devices adjacent a substrate and defining active circuit portions;
forming a first metal layer interconnecting predetermined ones of the plurality of semiconductor devices;
forming a first dielectric layer adjacent the first metal layer;
forming a second metal layer adjacent the first dielectric layer defining a ground plane;
forming a second dielectric layer adjacent the second metal layer;